

USER GUIDE
for the

HES98110
INPUT Module

User Guide for the
Imagine HES98110 INPUT Module
Document EPD02061 Issue 4 (07/03/03)

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P_{PREFACE}

Scope of this User Guide

The descriptions and instructions contained in this guide are based on the assumption that the *INPUT* module is being installed and used as part of an Helvar Merca Ltd. *Imagine* Lighting System.

Hardware/Software Versions

The details in this guide are based on the following:

PCB issue type: C.
Software version: 1.2.

Technical Specifications

Any technical data required for the correct installation and use of the *INPUT* module is contained in this user guide.

For full technical specifications of this product, reference should be made to the Technical Source leaflet (ref: EPD02060).

Trade Marks

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SECTION 1

INTRODUCTION

This section covers the following topics:

- Operating Overview.
- Features.

OPERATING OVERVIEW

The HES98110 *INPUT* module is an interface device for the Helvar Merca Ltd. *Imagine* Lighting System.

It monitors the state of various analogue and bistable input lines. Each time a change in state is detected on one of the inputs, this information is recorded by the *SCENESET* module(s) via the S-COM data highway. The *SCENESET* can use this data to control the recall or redirection of scenes.

An input is also provided for scene-recall devices which use the 2-wire Helvar LCS communications protocol. The module interprets the LCS commands and converts them to the S-COM protocol.

NOTE *This is a 'one-way' process only; S-COM commands are not converted to LCS.*

ESTA Mode

When ESTA mode is selected the bistable inputs are interpreted as an 8-bit or 6-bit binary code, with each code corresponding to a scene. The 6-bit option also allows the overall brightness of the last selected scene to be increased or decreased.

This mode is primarily intended for allowing the *Imagine* system to be used in conjunction with the Electrosonic ESTA range of products.

FEATURES

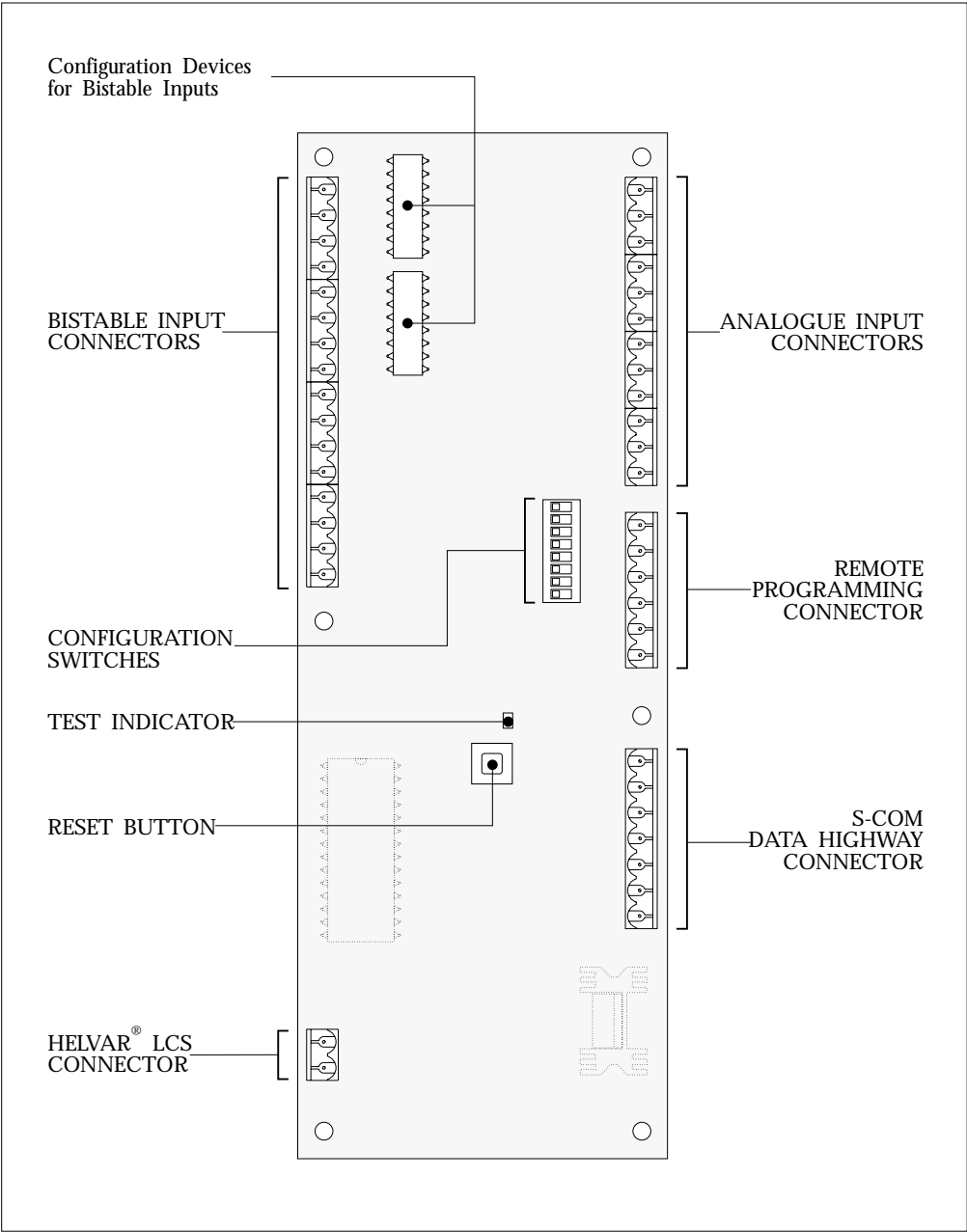


Fig.1-1: Key features of the INPUT module PCB.

Bistable Inputs

There are eight separate bistable inputs, each of which respond to a change in state i.e. OFF to ON, or ON to OFF. The inputs are arranged in two groups of four, with each group capable of being configured to one of two modes of operation.

Voltage-free switched input.

Opto-coupled input.

The operation is determined by the type of devices plugged into the PCB next to the bistable input-connectors. By changing the arrangement of these devices, the following input combinations can be obtained:

8 switched.

8 opto-coupled.

4 switched plus 4 opto-coupled.

Analogue Inputs

There are four separate analogue inputs which provide a percentage-value output in proportion to a 0 - 10V input, e.g. a 5V input will generate a 50% output value.

The output value lags behind the input level. The speed at which the output value changes to meet a change in input level can be set to 'fast' or 'slow'.

Remote Programming Socket

A connector is provided to allow for the attachment of a remote programming socket suitable for *SCENEMAKER* or *SCENEPLANNER*.

Configuration Switches

A bank of 8 miniature slide-switches is located near the centre of the *INPUT* module's PCB. These are used to select various operating parameters.

Reset Button & LED Indicator

The LED provides a basic visual indication of the *INPUT* module's operating status. The reset button is used to clear the module's data buffer. Full details of these controls is given in section 4.

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SECTION 2

INSTALLATION

This section covers the following topics:

- Wall Mounting.
- DIN Rail Mounting.
- Cable Access.
- Connection Details.

SITING REQUIREMENTS

The installation site must meet the following criteria:

Ambient temperature: 0C - 40C.

Humidity: 0% - 90% (non-condensing).

Wall Mounting

The *INPUT* module may be mounted on any flat surface and at any angle, provided that sufficient access is available for cabling and setting-up.

The cover can be removed by taking out the two top fixing screws (Fig.2-1). When refitting the cover, check that the sides slot into the vertical guides at each end of the base plate.

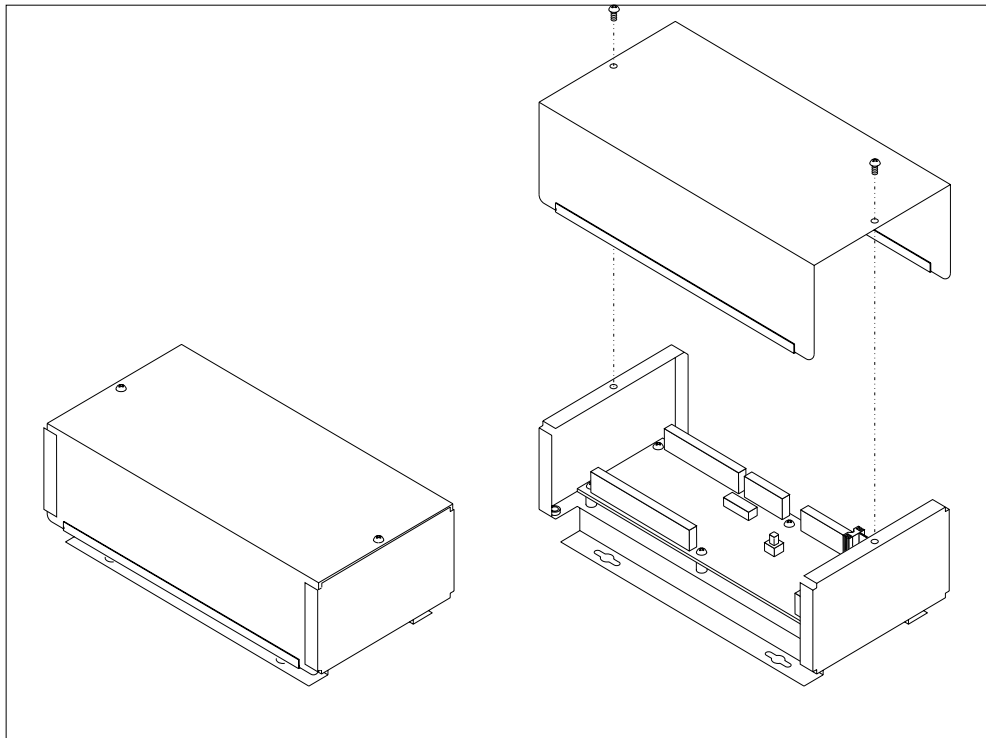


Fig.2-1: Removing the cover.

There are four 'keyhole' type fixing points on the base of the metal box which should be used to secure the module (see Fig.2-2). The type of fixings employed should be chosen according to the mounting surface.

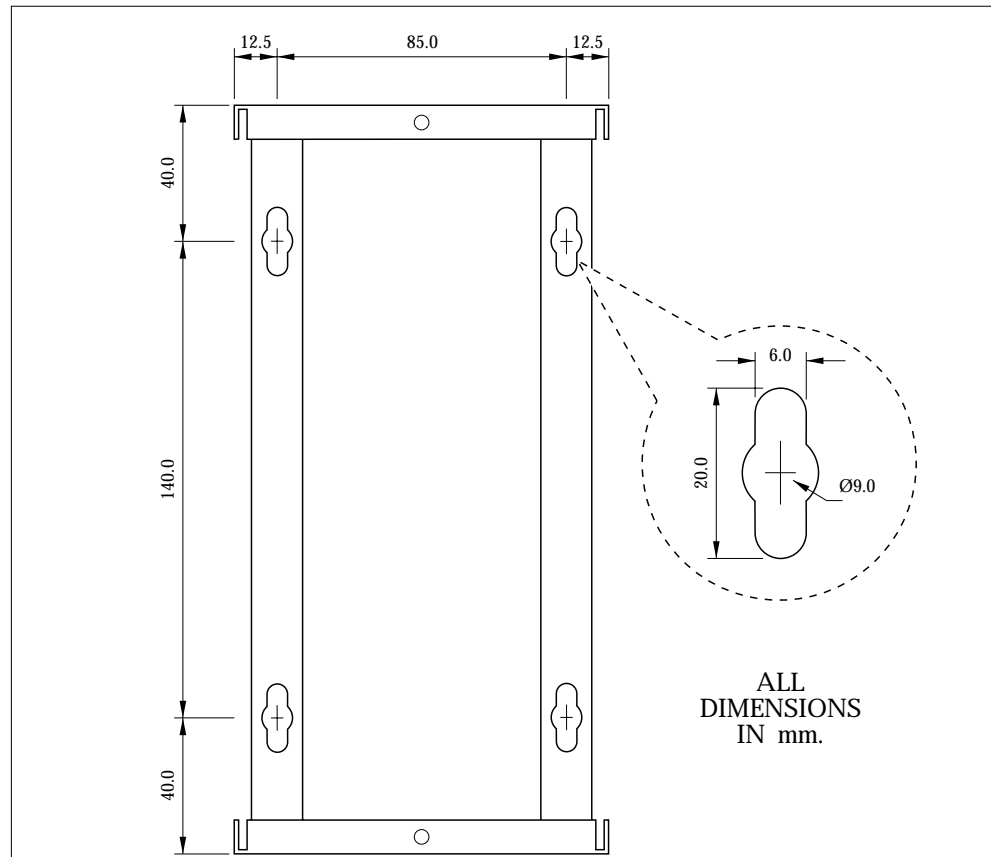


Fig.2-2: Dimensions and positions of keyhole fixings.

Cable Entry Points

With the top cover fitted, cables can enter the module from either side (Fig.2-3). It is recommended that cables are located on the side appropriate to their connector to avoid crossing-over of cables inside the casing.

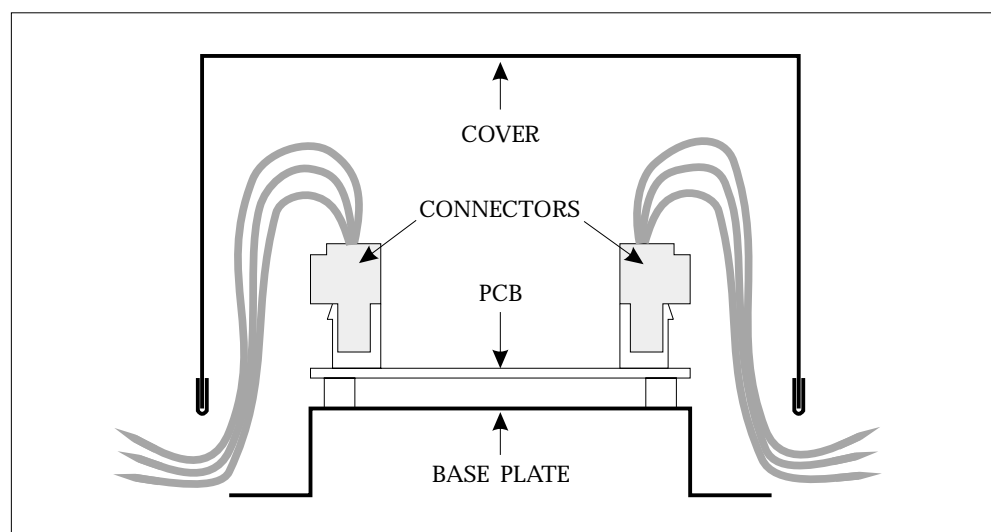


Fig.2-3: Cable entry arrangement.

DIN Rail Mounting Option

The *INPUT* module is also available in a DIN-Rail mounted version which comprises a PCB with various clip-together plastic extrusions. These are assembled around the PCB as shown in Fig 2-4.

The complete assembly can then be clipped on to a T35-type DIN rail.

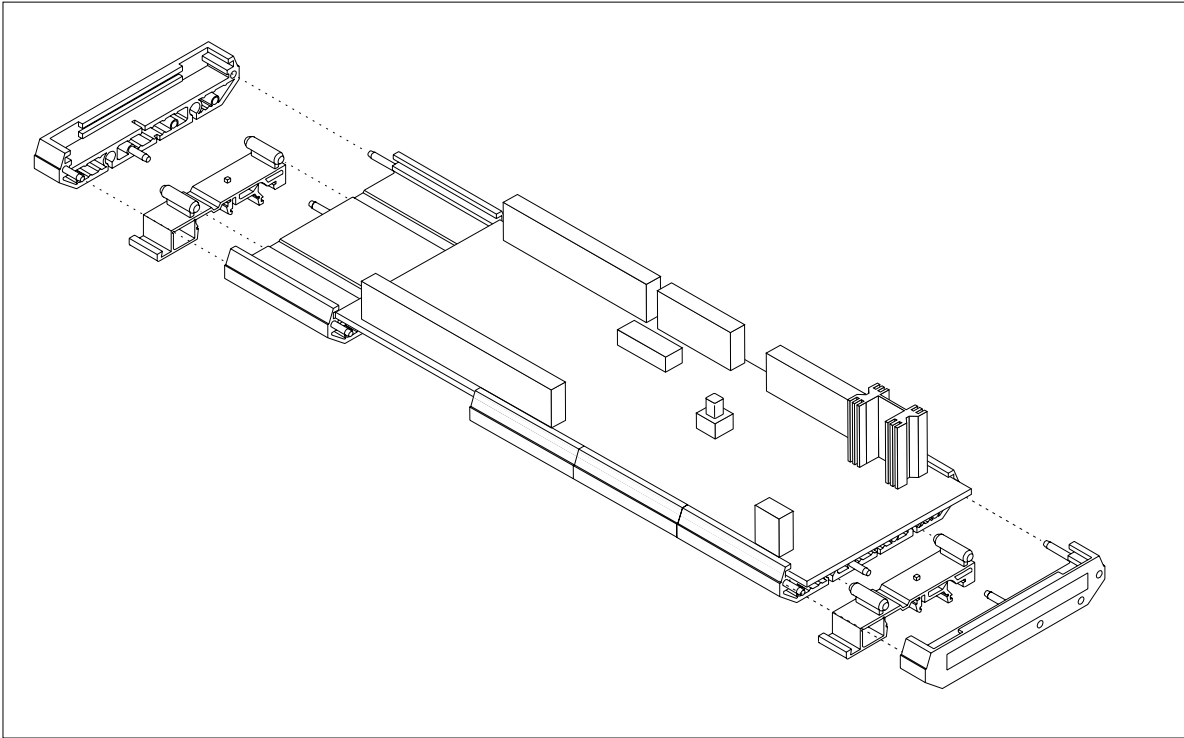


Fig.2-4: DIN-rail mounting-kit assembly

INPUT MODULE CONNECTIONS

Connecting points are available for the following functions:

- S-COM (external) Data Highway.
- Bistable Inputs.
- Analogue Inputs.
- Helvar LCS Input.
- Remote Programming Socket.

Suitable Mating Connectors

All connections to the *INPUT* module are made using 2-, 3-, 6- or 7-way screw-terminal plugs (not supplied):

| | | |
|-----------------------|----------------------------|---------|
| Helvar part numbers: | T862 | (2-way) |
| | T863 | (3-way) |
| | T866 | (6-way) |
| | T867 | (7-way) |
| Cable size: | 0.2 - 2.5mm ² . | |
| Stripping length: | 7mm. | |
| Screw torque setting: | 0.5Nm. | |

NOTE *For recommended cable types, please refer to the text for the appropriate connector.*

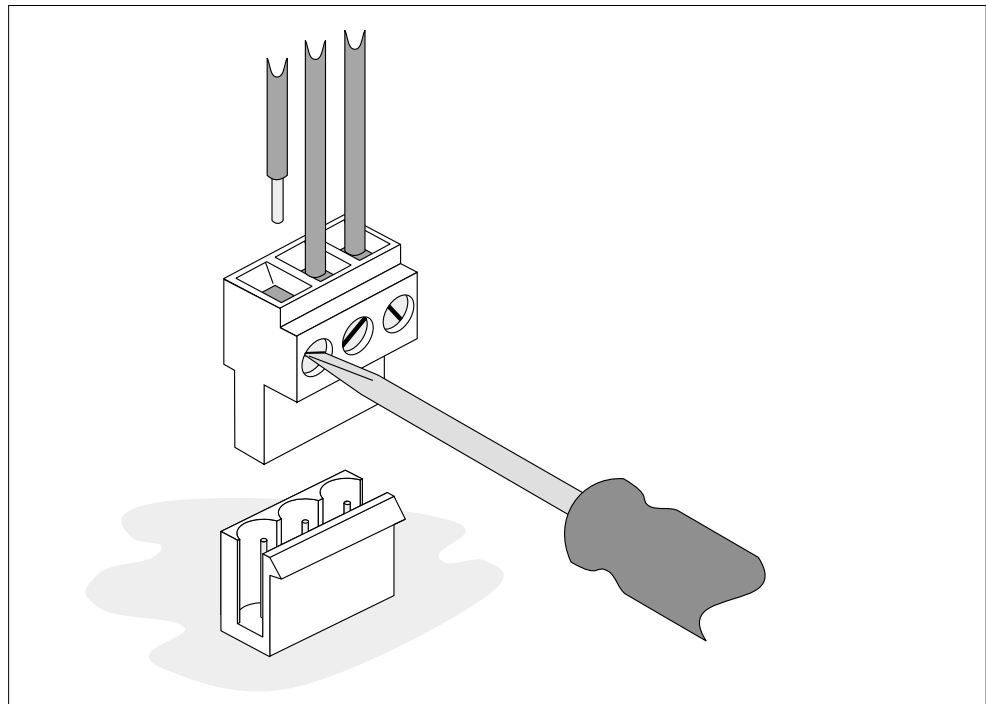


Fig.2-5: *Fitting a screw-terminal plug.*

S-COM (external) DATA HIGHWAY

This connector provides communication with the *SCENESet* module.

The *INPUT* module may be connected to one end of the data highway or at some point along it. The module and any other devices on the S-COM highway are linked together to form an open-ended ‘daisy-chain’.

When situated at one end of the highway, an ‘input’ cable is required carrying S-COM data and power from the *SCENESet* module (and any preceding devices).

When situated along the highway, an ‘output’ cable is also required which carries data and power to the remaining device(s) in the chain.

To assist with installation and any future fault-finding, it is suggested that each cable is labelled with its function (i.e. ‘input’ or ‘output’). Ensure that the foil screen of both cables is cut back and that the bare end is covered with an insulating sleeve. The screen drain wire must also be sleeved to prevent short-circuits (Fig.2-6).

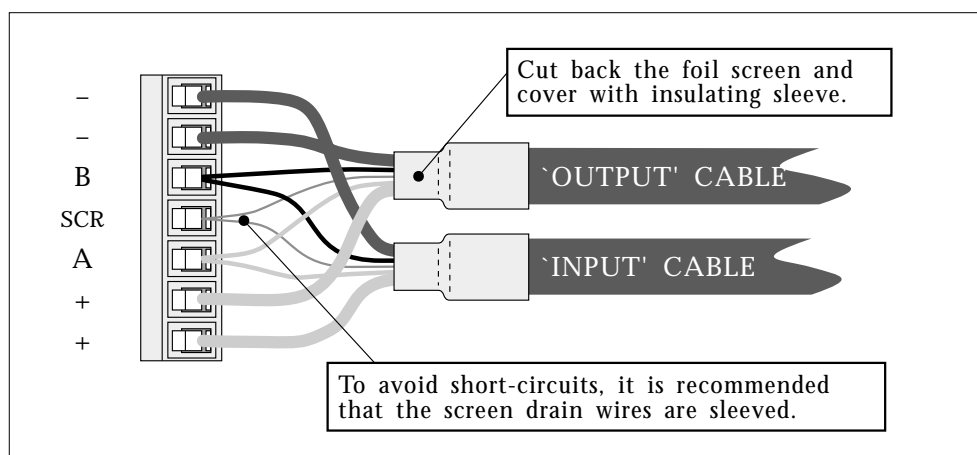


Fig.2-6: S-COM cable arrangement and labelling.

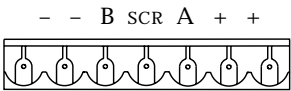
| Diagram | Pin | Function | Wire Colour |
|---|-----|-----------------------|--------------|
|  | - | Power ground ‘input’ | Grey |
| | - | Power ground ‘output’ | Grey |
| | B | S-COM data B | Black |
| | SCR | Screen (earth) | (drain wire) |
| | A | S-COM data A | Red |
| | + | Power supply ‘output’ | Purple |
| | + | Power supply ‘input’ | Purple |

Fig.2-7: Connection details for S-COM (external).

Connection Details

The S-COM cables are connected to the *INPUT* module using the 7-way connector labelled 'SCOM' (Fig.2-7).

Recommended cable type: Helvar S-COM cable.

Maximum cable length: 1000m (*which is the maximum total length of the S-COM highway*).

S-COM Loading

Each device that can be connected to the S-COM (external) data highway has a Unit Loading Factor (ULF) according to its power consumption. The basic loading for the *INPUT* module is as follows:

No inputs used: 1
 Bistable inputs only: 1
 Bistable & analogue inputs: 1.5

NOTE *Any devices connected to the LCS line will add to the basic ULF determined above (see page 18).*

Line Termination

If the *INPUT* module is located at one end of the data highway, set the configuration switch 8 ('T') to the 'ON' position (Fig.2-8).

If the module is located along the highway, set switch 8 to 'OFF'.

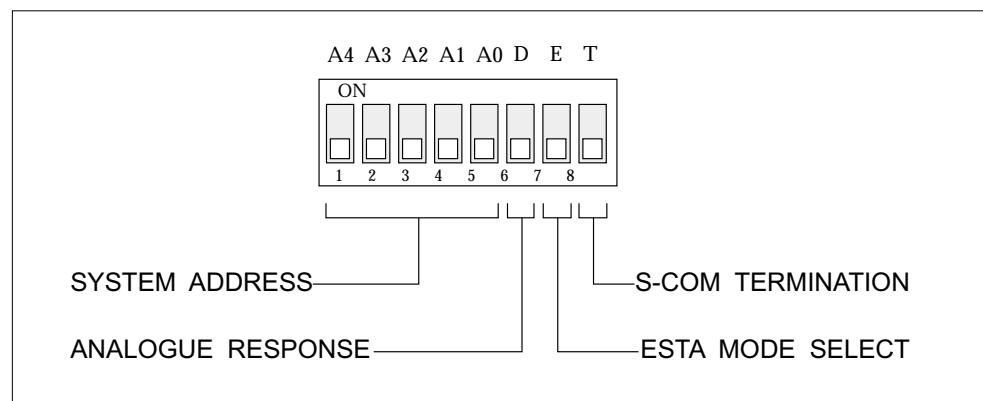


Fig.2-8: Setting the S-COM termination switch.

BISTABLE INPUTS

Input Configuration

The eight bistable inputs are arranged as two groups of four and each group can be separately configured to one of two operating modes:

- Voltage-free switched input (supplied as standard).
- Opto-coupled input (optional).

The operating mode is determined by the type of devices fitted adjacent to the input connectors (see Fig.2-9).

If these devices need to be removed or replaced, always use a suitable I.C. removal/insertion tool and ensure that the opto-couplers are correctly orientated. The resistor networks can be inserted in either polarity.

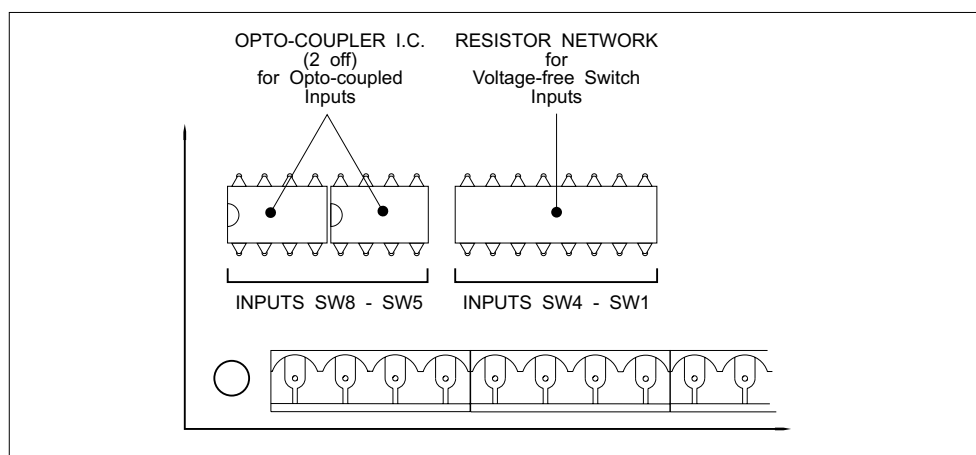


Fig.2-9: Configuration devices for bistable inputs.

Connection Details

Connection to each input is via separate 2-way connectors labelled 'SW1' to 'SW8'. The pin-out details are the same for each connector (Fig.2-10):

- Recommended cable type: Equipment wire.
- Max. cable length (per input): 50m (switched),
1000m (opto-coupled).

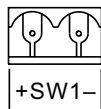
| Connector Diagram | Pin | Function |
|---|-----|---------------------------------|
|  | + | Bistable input. (SW1 to SW8) |
| | - | Ground (0V). |

Fig.2-10: Connection details for bistable input.

Circuit Details

Fig.2-11 shows typical application circuits for both switched and opto-coupled inputs. The representation of the module's input circuit is included for clarity and is not intended to provide an accurate circuit diagram. In both examples, the input is 'ON' when the switch is closed.

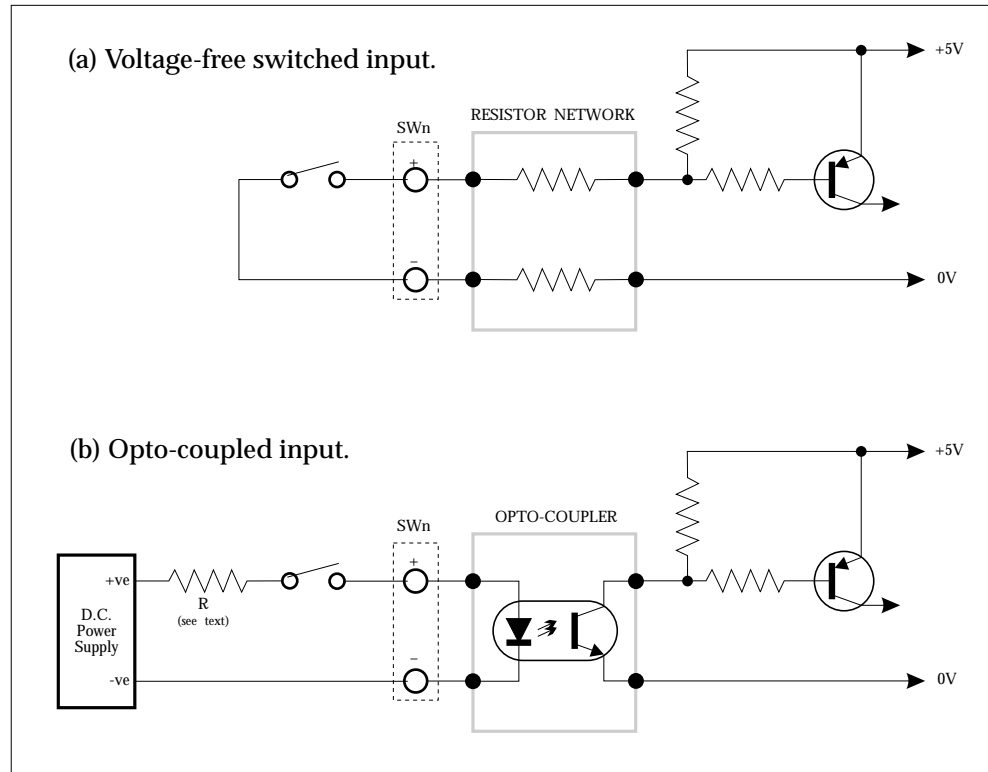


Fig.2-11: Typical bistable input circuits.

It should be noted that for opto-coupled operation, an external DC power supply is required. A series resistor must be included to limit the current through the input LED to around 20mA. The resistor value may be calculated as follows:

$$R = \frac{(V - 1)}{0.02}$$

where R is the series resistance in Ohms, and V is the applied voltage.

IMPORTANT NOTES

The input current must not exceed 60mA otherwise damage may occur to the opto-coupler.

The voltage difference between the input and output of each opto-coupler must not exceed 50V (with respect to the module's 0V line).

ANALOGUE INPUTS

Connection Details

Connection to each of the analogue inputs is via separate 3-way connectors labelled 'CH1' to 'CH4'. The pin-out details are the same for each connector (Fig.2-12).

Each connector has a 0V and 10V reference line; these are electrically common to each connector. The current that can be drawn from all four lines simultaneously must not exceed 10mA in total.

Recommended cable type: Equipment wire.

Max. cable length (per input): 50m.

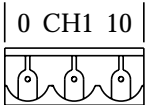
| Connector Diagram | Pin | Function |
|--|--------|---------------------------------|
|  | 10 | 10V D.C. supply |
| | CH n | Analogue input. (CH1 to CH4) |
| | 0 | Ground (0V). |

Fig.2-12: Connection details for analogue inputs.

Setting the Response Speed

For a full explanation of the analogue response speed, please refer to section 3, page 23.

To select the slow response, set switch 6 ('D') to the 'OFF' position.

To select the fast response, set switch 6 to the 'ON' position.

Circuit Details

Fig.2-13 shows typical application circuits for an analogue input using a light-sensitive resistor.

If an external power supply is used to provide the analogue voltage, the 0V line of the supply *must* be linked to the 0V line of the *INPUT* module.

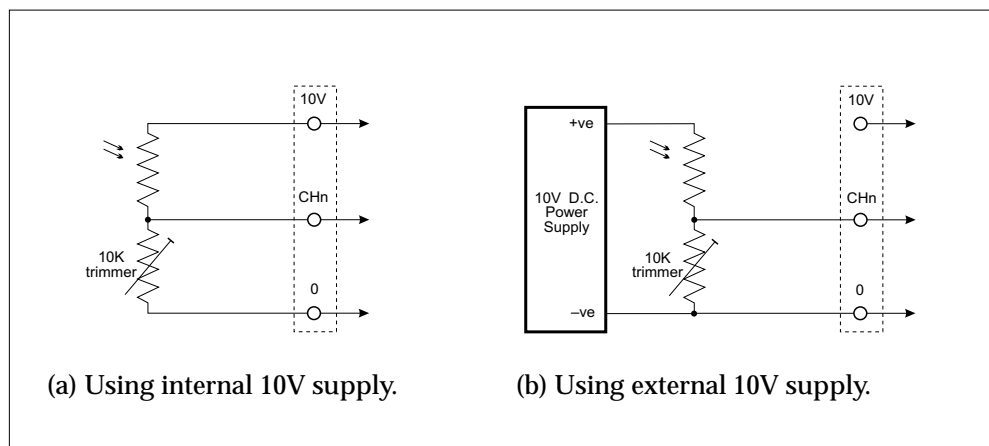


Fig.2-13: Typical analogue input circuits.

HELVAR LCS INPUT

This input allows devices using the Helvar LCS (Lighting Control System) protocol to communicate with the *Imagine* system.

Connection Details

Connection to the LCS input is via the 2-way connector labelled 'LCS' (Fig.2-14):

Recommended cable type: 2-core.
Maximum cable length: 100m.


| Connector Diagram | Pin | Function |
|--|-----|-----------------------|
|  NA NG LCS | NA | LCS transmit/receive. |
| | NG | LCS ground. |

Fig.2-14: Connection details for the LCS input.

LCS Loading

Each device that can be connected to the LCS data highway has a Unit Loading Factor (ULF) according to its power consumption:

Helvar LCS Panel: 0.25
Helvar LCS Infra-red Unit: 1.0

Any number of devices may be connected up to a maximum total ULF of 2.5 (e.g. 10 panels). This value must be added to the basic ULF determined on page 13.

REMOTE PROGRAMMING CONNECTOR

This allows the HES93010 Remote Programming Socket to be connected to the S-COM data highway. Under no circumstances should this connector be used for S-COM devices other than *SCENEMAKER* or *SCENEPLANNER*.

Connection Details

Connection is via the 6-way connector situated between the S-COM and analogue connectors (Fig.2-15):

Recommended cable type: Helvar S-COM cable
or 5-core screened
(see HES93010 instructions for further details).

Maximum cable length: 100m.

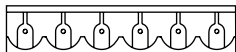
| Diagram | Pin | Function | Wire Colour |
|---|--------|-------------------|---|
| DETECT - B SCR A +  | DETECT | Mode sense line | See HES93010 instructions for recommended colours |
| | - | Power ground (0V) | |
| | B | S-COM data B | |
| | SCR | Screen (earth) | |
| | A | S-COM data A | |
| | + | Power supply | |

Fig.2-15: Connection details for the remote socket.

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SECTION 3

SETTING-UP & OPERATION

This section covers the following topics:

- Configuration Switches.
- Setting the System Address.
- Selecting ESTA Mode.
- LCS Scene-selection.
- Setting an LCS Panel Address.
- Setting an LCS Infra-red Remote Control Address.
- Power-up Test.

CONFIGURATION SWITCHES

A bank of eight DIL slide switches is provided on the module PCB (Fig.3-1) which are used to set the following parameters:

- Analogue Response Time.
- System Address (for normal and ESTA operation).
- S-COM Termination (see section 2, page 13).
- ESTA Mode.

All the switches are factory-set to the 'OFF' position. Before applying power to the module, the switches must be set according to the details on the following pages.

Each switch can be operated by using the blade of a small screwdriver (or similar instrument).

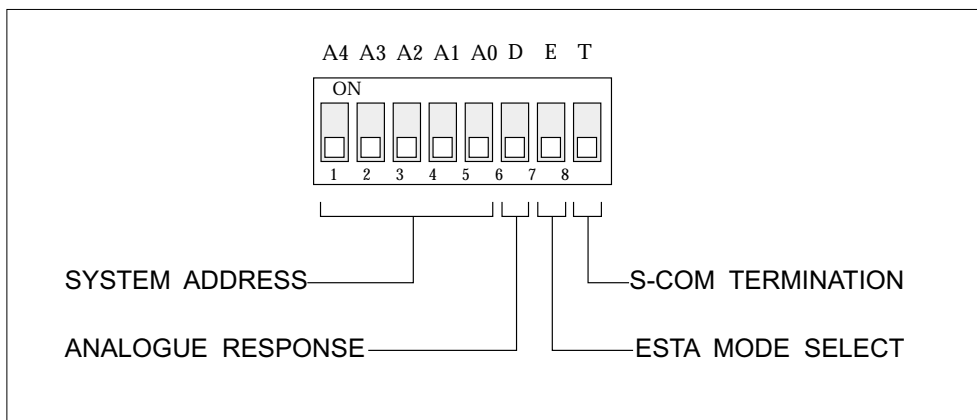


Fig.3-1: Configuration switches.

ANALOGUE RESPONSE TIME

When a change in level occurs on an analogue input, the corresponding change in the output value is delayed exponentially.

This delay can be set to one of two speeds:

- | | |
|------|--|
| Fast | suitable for general high-speed applications. |
| Slow | suitable for light-level sensing (e.g. dawn/dusk). |

For example, if the level of an analogue input changes instantly from zero to +10V, the output value will progressively increase towards 100%, as shown in Fig.3-2.

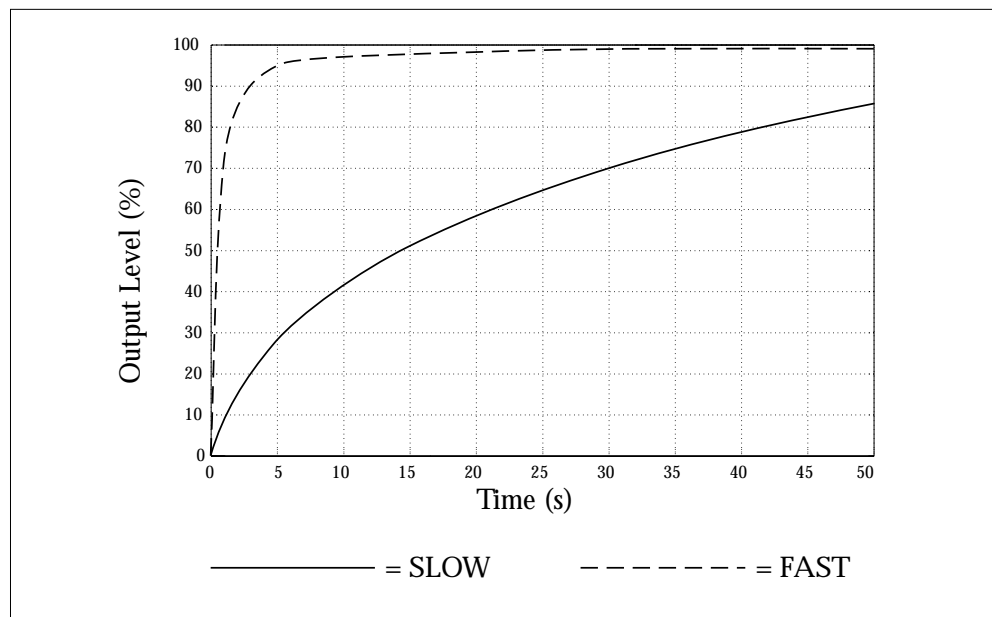


Fig.3-2: Typical output response for analogue input.

Once the output value is within 3% of the new input level, the output will stabilise. Thus, output values can only fall within the range 3% to 97%.

Changes in the input level will be ignored unless the difference between the input and output exceeds $\pm 3\%$ (0.3V).

To select the slow response, set switch 6 ('D') to the 'OFF' position.
To select the fast response, set switch 6 to the 'ON' position.

NOTE *The selected speed is applied to all four analogue inputs.*

SYSTEM ADDRESS (Normal Mode)

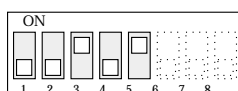
To enable the *INPUT* module to communicate with the *Imagine* system, a valid system address must be set on the 5 address switches (A0 to A4).

For normal operation (non-ESTA), switch 7 ('E') must be 'OFF'.

A *SCENES* module can monitor the state of up to 248 bistable inputs or 124 analogue inputs from up to 31 *INPUT* modules (depending on the S-COM loading). The *SCENES* assigns reference numbers to each of these inputs relative to the *INPUT* module's address.

Each *INPUT* module must be set to a different address in accordance with the following table:

Example:



$$5 = 00101$$

| Address | | Bistable Input Reference Numbers | | | | | | | |
|---------|----------|----------------------------------|-----|-----|-----|-----|-----|-----|-----|
| | | SW1 | SW2 | SW3 | SW4 | SW5 | SW6 | SW7 | SW8 |
| No. | Sw. Code | Analogue Input Reference Numbers | | | | | | | |
| | | CH1 | CH2 | CH3 | CH4 | — | — | — | — |
| 0 | 00000 | Invalid address. | | | | | | | |
| 1 | 00001 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 2 | 00010 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 3 | 00011 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 4 | 00100 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |
| 5 | 00101 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 6 | 00110 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 |
| 7 | 00111 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 |
| 8 | 01000 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 |
| 9 | 01001 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 |
| 10 | 01010 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 11 | 01011 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 |
| 12 | 01100 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 |
| 13 | 01101 | 97 | 98 | 99 | 100 | 101 | 102 | 103 | 104 |
| 14 | 01110 | 105 | 106 | 107 | 108 | 109 | 110 | 111 | 112 |
| 15 | 01111 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 |

| Address | | Bistable Input Reference Numbers | | | | | | | |
|---------|----------|----------------------------------|-----|-----|-----|-----|-----|-----|-----|
| | | SW1 | SW2 | SW3 | SW4 | SW5 | SW6 | SW7 | SW8 |
| No. | Sw. Code | Analogue Input Reference Numbers | | | | | | | |
| | | CH1 | CH2 | CH3 | CH4 | — | — | — | — |
| 16 | 10000 | 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 |
| 17 | 10001 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 |
| 18 | 10010 | 137 | 138 | 139 | 140 | 141 | 142 | 143 | 144 |
| 19 | 10011 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | 152 |
| 20 | 10100 | 153 | 154 | 155 | 156 | 157 | 158 | 159 | 160 |
| 21 | 10101 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 |
| 22 | 10110 | 169 | 170 | 171 | 172 | 173 | 174 | 175 | 176 |
| 23 | 10111 | 177 | 178 | 179 | 180 | 181 | 182 | 183 | 184 |
| 24 | 11000 | 185 | 186 | 187 | 188 | 189 | 190 | 191 | 192 |
| 25 | 11001 | 193 | 194 | 195 | 196 | 197 | 198 | 199 | 200 |
| 26 | 11010 | 201 | 202 | 203 | 204 | 205 | 206 | 207 | 208 |
| 27 | 11011 | 209 | 210 | 211 | 212 | 213 | 214 | 215 | 216 |
| 28 | 11100 | 217 | 218 | 219 | 220 | 221 | 222 | 223 | 224 |
| 29 | 11101 | 225 | 226 | 227 | 228 | 229 | 230 | 231 | 232 |
| 30 | 11110 | 233 | 234 | 235 | 236 | 237 | 238 | 239 | 240 |
| 31 | 11111 | 241 | 242 | 243 | 244 | 245 | 246 | 247 | 248 |

IMPORTANT NOTE

Each INPUT module in a system must be set to a different address, regardless of which mode it is set for.

SYSTEM ADDRESS (ESTA Mode)

To select ESTA mode, switch 7 ('E') must be set to the 'ON' position. In this mode, there are two options available:

Option 1 — All of the bistable inputs (SW1 to SW8) are interpreted as an 8-bit binary number; each number recalls one of 256 scenes.

Option 2 — Six of the bistable inputs (SW1 to SW6) are interpreted as a 6-bit binary number (allowing access to 64 scenes), whilst the other two inputs can be used to increase or decrease the overall 'brightness' of the last selected scene.

NOTE *The inputs are 'edge-triggered', i.e. scenes are only triggered when one or more inputs changes state. Thus, once a particular scene has been selected, the input lines must remain stable until the next scene is required.*

Since up to 1024 scenes may be available within the *Imagine* system, the scenes are accessed in 4 'blocks' of either 256 or 64 scenes. The option and the appropriate block of scenes are chosen by using the 5 address switches (A0 to A4) according to the table below:

| Address | | Scenes Available | Analogue Input Reference Numbers | | | |
|----------|-------|------------------|----------------------------------|-----|-----|-----|
| No. | Code | | CH1 | CH2 | CH3 | CH3 |
| OPTION 1 | | | | | | |
| 1 | 00001 | 0 – 255 | 1 | 2 | 3 | 4 |
| 2 | 00010 | 256 – 511 | 9 | 10 | 11 | 12 |
| 3 | 00011 | 512 – 767 | 17 | 18 | 19 | 20 |
| 4 | 00100 | 768 – 1023 | 25 | 26 | 27 | 28 |
| OPTION 2 | | | | | | |
| 5 | 00101 | 0 – 63 | 33 | 34 | 35 | 36 |
| 6 | 00110 | 256 – 319 | 41 | 42 | 43 | 44 |
| 7 | 00111 | 512 – 575 | 49 | 50 | 51 | 52 |
| 8 | 01000 | 768 – 831 | 57 | 58 | 59 | 60 |

IMPORTANT NOTE

Each INPUT module in a system must be set to a different address, regardless of which mode it is set for.

Analogue Inputs in ESTA Mode

When ESTA mode is selected, the four analogue inputs are ‘seen’ in the same manner as normal mode. However, because the address in ESTA mode can only be set to one of eight values, the range of reference numbers assigned to the inputs is restricted.

If an address is set other than those listed, ESTA mode will be disabled and the bistable inputs will behave as in normal mode.

Changing the Scene ‘Brightness’

When option 2 is being used, making bistable input SW7 ‘active’ will increase the overall ‘brightness’ of the last selected scene. If SW8 is made active, the brightness level will decrease.

This function is similar to the modifier facility on certain types of *SCENECOMMANDER*. Any adjustment made to the brightness of a scene can be cleared by recalling the original scene.

NOTE *If both SW7 and SW8 are active at once, the brightness level will not change.*

SCENE SELECTION USING LCS

Any devices connected to the LCS input can be used to recall scenes from the *Imagine* system directly, regardless of which operating mode is selected.

The *INPUT* module's address selects the range of scenes that can be accessed via the LCS line in accordance with the following table:

| Address | | Scene Range | Range Offset | Address | | Scene Range | Range Offset |
|---------|-------|-----------------|--------------|---|-------|-------------|--------------|
| No. | Code | | | No. | Code | | |
| 0 | 00000 | Invalid address | | 11 | 01011 | 561–616 | 560 |
| 1 | 00001 | 1–56 | 0 | 12 | 01100 | 617–672 | 616 |
| 2 | 00010 | 57–112 | 56 | 13 | 01101 | 673–728 | 672 |
| 3 | 00011 | 113–168 | 112 | 14 | 01110 | 729–784 | 728 |
| 4 | 00100 | 169–224 | 168 | 15 | 01111 | 785–840 | 784 |
| 5 | 00101 | 225–280 | 224 | 16 | 10000 | 841–896 | 840 |
| 6 | 00110 | 281–336 | 280 | 17 | 10001 | 897–952 | 896 |
| 7 | 00111 | 337–392 | 336 | 18 | 10010 | 953–1008 | 952 |
| 8 | 01000 | 393–448 | 392 | 19 | 10011 | 1008-1064* | 1008 |
| 9 | 01001 | 449–504 | 448 | * The <i>Imagine</i> system has a maximum of 1024 scenes available. | | | |
| 10 | 01010 | 505–560 | 504 | | | | |

Invalid Scenes

If a scene is requested by the LCS system which is outside the limits of the *Imagine* system, an 'out-of-range' error will be generated by the *SCENESSET* module.

This can be avoided by confining any *INPUT* modules which are using LCS to an address between 1 and 18 (inclusive).

LCS PUSH-BUTTON PANELS

The scenes that can be recalled by a panel are determined by that panel's own address. The table below shows the scene allocation for each panel button when the *INPUT* module is set to address 1.

| LCS Panel Address Switches | | | | Scenes allocated to each button | | | | | |
|----------------------------|----|----|----|---------------------------------|----|----|----|----|----|
| S1 | S2 | S3 | S4 | 1 | 2 | 3 | 4 | 5 | 6 |
| 0 | 1 | 1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | 0 | 1 | 0 | 9 | 10 | 11 | 12 | 13 | 14 |
| 0 | 0 | 1 | 0 | 17 | 18 | 19 | 20 | 21 | 22 |
| 1 | 1 | 0 | 0 | 25 | 26 | 27 | 28 | 29 | 30 |
| 0 | 1 | 0 | 0 | 33 | 34 | 35 | 36 | 37 | 38 |
| 1 | 0 | 0 | 0 | 41 | 42 | 43 | 44 | 45 | 46 |
| 0 | 0 | 0 | 0 | 49 | 50 | 51 | 52 | 53 | 54 |

To find the scenes associated with other *INPUT* module addresses, simply add the 'range-offset' value (from the table on page 28) to the scene numbers above. For example, with the *INPUT* module at address 3, the range-offset is 112. Thus, with the panel address set to 0000, the scene on button 1 would be $49 + 112$ (i.e. 161), and so on.

On 4-button panels, the scenes allocated to buttons 5 and 6 cannot be accessed.

On 8-button panels, buttons 1 to 6 will recall scenes whilst buttons 7 and 8 will act as a 'modifier'. Button 7 will increase the overall brightness of the last selected scene and button 8 will decrease the brightness.

IMPORTANT NOTE

*LCS panel addresses other than those listed above are **not** suitable for use with the *INPUT* module because the scene allocation is less easily predicted.*

LCS INFRA-RED REMOTE CONTROL UNIT

The scenes that can be recalled by a remote control unit are determined by that device's own address. Depending on the address selected, scenes can be recalled by one- or two-button operation.

One-button Operation

The table below shows the scene allocation for each remote control button when the *INPUT* module is set to address 1:

| LCS Remote Unit Address | | | | | Scenes allocated to each button | | | | | | | |
|-------------------------|----|----|----|----|---------------------------------|----|----|----|----|----|-----|-----|
| S1 | S2 | S3 | S4 | S5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 0 | 1 | 0 | 0 | 0 | 9 | 10 | 11 | 12 | 13 | 14 | inc | dec |
| 0 | 1 | 0 | 0 | 1 | 17 | 18 | 19 | 20 | 21 | 22 | - | - |
| 0 | 1 | 1 | 0 | 0 | 25 | 26 | 27 | 28 | 17 | 18 | 19 | 20 |
| 0 | 0 | 0 | 0 | 0 | 25 | 26 | 27 | 28 | 29 | 30 | inc | dec |
| 0 | 0 | 1 | 0 | 0 | 25 | 26 | 27 | 28 | 33 | 34 | 35 | 36 |
| 0 | 0 | 0 | 0 | 1 | 33 | 34 | 35 | 36 | 37 | 38 | inc | dec |
| 0 | 0 | 0 | 1 | 0 | 41 | 42 | 43 | 44 | 45 | 46 | inc | dec |
| 0 | 0 | 1 | 0 | 1 | 41 | 42 | 43 | 44 | 49 | 50 | 51 | 52 |
| 0 | 0 | 0 | 1 | 1 | 49 | 50 | 51 | 52 | 53 | 54 | inc | dec |

To find the scenes associated with other *INPUT* module addresses, simply add the 'range-offset' value (from the table on page 28) to the scene numbers above. For example, with the *INPUT* module at address 3, the range-offset is 112. Thus, with the panel address set to 00011, the scene on button 1 would be 49 + 112 (i.e. 161), and so on.

For some address settings on the remote control unit, buttons 7 and 8 will act as a 'modifier'. Button 7 will increase the overall brightness of the last selected scene and button 8 will decrease the brightness. These are indicated by 'inc' and 'dec' in the table above.

Two-button Operation

With the address switches on the remote control unit set to '01111', scenes can be recalled by pressing two buttons in succession. The table below shows the scene allocation for each 'pair' of buttons when the *INPUT* module is set to address 1:

| LCS Remote Unit Address | | | | | 1st button pressed | 2nd button pressed | Scene recalled |
|-------------------------|----|----|----|----|--------------------|--------------------|----------------|
| S1 | S2 | S3 | S4 | S5 | | | |
| 0 | 1 | 1 | 1 | 1 | 5 | 1 | 25 |
| | | | | | | 2 | 26 |
| | | | | | | 3 | 27 |
| | | | | | | 4 | 28 |
| | | | | | 6 | 1 | 33 |
| | | | | | | 2 | 34 |
| | | | | | | 3 | 35 |
| | | | | | | 4 | 36 |
| | | | | | 7 | 1 | 41 |
| | | | | | | 2 | 42 |
| | | | | | | 3 | 43 |
| | | | | | | 4 | 44 |
| | | | | | 8 | 1 | 49 |
| | | | | | | 2 | 50 |
| | | | | | | 3 | 51 |
| | | | | | | 4 | 52 |

As with one-button operation, to find the scenes associated with other *INPUT* module addresses, simply add the 'range-offset' value (from the table on page 28) to the scene numbers above.

IMPORTANT NOTE

*LCS remote control addresses other than those listed above are **not** suitable for use with the INPUT module because the scene allocation is less easily predicted.*

POWER-UP TEST

When power is first applied to the *INPUT* module (via the S-COM data highway) the LED test indicator on the PCB will flash continuously until the module has been logged-on to the system. This should take no longer than 30 seconds.

Once the module is logged-on and communication is established, the LED will turn-off.

Each time the module responds to a change on one or more of its inputs, the LED will flash:

A change in state of a bistable input or a small change in level of an analogue input will cause a short burst of flashes.

A large change in level of an analogue input will cause several flashes in rapid succession.

Thus, each of the input circuits can easily be checked for correct operation.

If the module appears to be operating correctly, resecure the cover.

SECTION 4

TROUBLESHOOTING

This section covers the following topics:

- Test Indicator & Reset Button.
- Problem Diagnosis.

TEST INDICATOR & RESET BUTTON

The LED indicator flashes each time a change in state occurs on one of the input lines. Each individual change is referred to as an ‘event’. Data regarding each event is held in a buffer until the *SCENESET* module requests the information to be down-loaded.

Pressing the reset button clears the *INPUT* module’s event buffer. Any data which was being held or transmitted will be lost.

The button and indicator can be used in to determine certain fault conditions as detailed in the table opposite.

Interference and ‘Noise’

If false triggering of scenes occurs, this could be caused by interference on the S-COM line or LCS line (if in use). In electrically ‘noisy’ environments the module itself may be susceptible to picking-up interference particularly on any unused inputs.

To reduce this problem, the metal casing can be connected to the S-COM screen (or earth). Cables for the bistable and analogue inputs should be kept as short as possible, and the use of screened cable may be considered in extreme instances.

PROBLEM DIAGNOSIS

| Problem | Likely Cause & Remedy |
|---|---|
| The test LED does not light-up or flash when first connected. | <p>No S-COM power supply.</p> <p>Press and hold the reset button; if the LED flashes, then power is present. If not, check for power on the S-COM data highway.</p> |
| <p>Test LED flashes continuously.</p> <p><i>SCENESET</i> is not recording some or all events.</p> | <p>If the flash-rate is steady, this probably indicates that S-COM communication has been lost (or not achieved).</p> <p>Check that the address has been set correctly.</p> <p>If the flash-rate is fast and erratic, then a large number of events are being processed from one or more inputs. To check this, unplug all bistable, analogue and LCS connections, then press the reset button; the LED should stop flashing.</p> |
| Erratic response to bistable or analogue inputs. | <p>Input wires are open- or short-circuit or are too long.</p> <p>No external power supply for opto-coupled inputs.</p> <p>Too many events being received – see LED responses listed above.</p> |
| LCS devices are not functioning correctly, although the <i>INPUT</i> module appears to be operating normally. | <p>Check that the NA and NG connections have not be reversed.</p> <p>Check for short or open circuits on the LCS data highway.</p> <p>The LCS highway could be too long.</p> |
| The LED's are flashing on some or all LCS devices. | <p>The <i>INPUT</i> module is unable to communicate successfully with the <i>SCENESET</i>.</p> <p>Check that the <i>SCENESET</i> module is functioning correctly.</p> |
| Erratic or false triggering from LCS devices. | LCS highway is too long or is 'noisy'. |

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